Paper Cade: BCADSC 2.3	Paper Title: Data Structures	Teaching Hours: 5 Hrs / Week
Total Teaching Hours: 60Hrs	Marks: Th-80+IA-20	Credits: 3

UNIT I

Advanced C: Dynamic memory allocation and pointers in C- Declaring and initializing pointers, Pointer & Functions, Pointer & Strings, Pointer& Structure, Pointer to Pointer. Command line arguments, Static and dynamic memory allocation. Memory allocation functions :malloc, calloc, free and realloc. File Management in C: Defining ,declaring a file, Opening & Closing File, Input & Output Operations on Files, Random Access to Files, File error handling functions.

12 Hrs

UNIT II

Introduction to Data structures: Definition, Classification of data structures: primitive and non-primitive. Operations on data structures Search: Basic Search Techniques- sequential search, Binary search- Iterative and Recursive methods. Sort-General Background: Definition, different types: Bubble sort, Selection sort, Merge sort, Insertion sort, Quick sort.

12 Hrs

UNIT III

Recursion: Definition, Recursion in C, Writing Recursive programs – Binomial coefficient, Fibonacci, GCD, towers of Hanoi. Stack – Definition, Array representation of stack, Operations on stack-push and pop, Infix, prefix and postfix notations, Conversion of an arithmetic expression from Infix to postfix, applications of stacks. **12 Hrs**

UNIT IV

Queue - Definition, Array representation of queue, Types of queue: Simple queue, circular queue, double ended queue (dequeue) priority queue, operations on ordinary queue and circular queues. **12 Hrs**

UNIT V

Linked list – Definition, components of linked list, representation of linked list, advantages and disadvantages of linked list, Arrays versus linked list, Types of linked list: Singly linked list, doubly linked list, Circular linked list and circular doubly linked list. Operations on singly linked list: creation, insertion, deletion, search and display. **12 Hrs**

References

1. Data structures using 'C'– Padma Reddy
2. A.K. Sharma, Data Structures Using C, 2nd edition, PearsonEducation.
3. Achuthsankar S. Nair, T. Makhalekshmi, Data Structures in C,PHI.
4. Prof. S.Nandagopalan, Fundamental of Data Structures with C.
5. Mark Allen Weiss, Data Structures and Algorithm Analysis in C, PearsonEducation.

Additional Reading

1. A.M. Tenenbaum, Y, Langsam, M. J. Augustein, R. L. Kruse, B. P. Leung and C. L. Tondo, Data Structures using C,PHI.
2. Trembley, An introduction to Data Structures with applications, Tata McGrawHill.
3. C. Loudon, Mastering Algorithms, SPD/O'REILL